Atty. Docket No. 35512-33

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

G. MICHAEL PHILLIPS, ET AL.

Serial No.: 09/615,021

Filed: July 13, 2000

For: SENSITVITY/ELASTICITY-BASED ASSET
       EVALUATION AND SCREENING

Group Art Unit: 3624

Examiner: Subramanian, Narayanswamy

APPELLANTS' BRIEF
ON APPEAL TO THE BOARD OF PATENT APPEALS AND INTERFERENCES

Mail Stop Appeal Brief - Patent
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Dear Sir:

Appellants in the above-captioned patent application appeal the final rejection of

claims 1-27, 37 and 39 set forth in the Office Action mailed October 9, 2003, a Notice of

Appeal having been filed on December 15, 2003.

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GROUP 3600

REAL PARTY IN INTEREST

The real party in interest in this application is c4cast.com, Inc., pursuant to an assignment recorded on July 13, 2000, at reel 010975, frame 0300.

RELATED APPEALS AND INTERFERENES

Appellants are not aware of any related appeals or interferences. [Check this]

STATUS OF CLAIMS

Claims 1-27, 37 and 39 have been finally rejected and are the subject matter of this appeal. In accordance with 37 C.F.R. § 1.192(c)(9), a copy of the claims involved in this appeal is included in Appendix A attached hereto.

STATUS OF THE AMENDMENTS

No amendment has been filed subsequent to the final rejection.

SUMMARY OF THE INVENTION

Investors and financial managers have long applied stock screening tools for the purposes of identifying companies satisfying certain pre-specified requirements. For example, the Internet sites Marketguide.com, finance.yahoo.com, and Media General Corporation's CD database MegaInsight.com all allow for the identification of companies that satisfy specified criteria. To date, these criteria primarily have included: (i) accounting data and associated ratio calculations, using data from a company's balance sheets and income statements; (ii) data regarding the company's stock price and/or

trading volume; and (iii) other information describing the company, such as location of home office, industry code, or number of employees.

While such screening tools have been helpful to a point, the present inventors have concluded that more useful evaluation and screening tools and techniques are desirable in connection with portfolio management and financial planning.

Thus, the present invention concerns systems, methods and techniques for estimating the future tendency of the value of an asset to change (e.g., price sensitivities or elasticities; see page 12, lines 10-15) based on a change in one or more exogenous variables. For example, the techniques of the present invention might be utilized to project future price sensitivities or elasticities based on predictions for such exogenous variables. Allowing one to predict, e.g., the future price sensitivity of a particular asset to fluctuations in other measures and variables often can permit better management of, and/or accounting for, specified types of risk (e.g., risk based on interest-rate fluctuations).

Initially, historical data for the value of an asset is processed together with historical data values for several exogenous variables to obtain a formula for calculating a measure of a tendency of the asset value to change as a result of changes in the data values for the exogenous variables (e.g., a price sensitivity or price elasticity formula), where such formula is a function of such exogenous variables. Projected data values are obtained for the exogenous variables, and a measure of the tendency of the asset value to change based on a change in at least one of the exogenous variables is estimated using the obtained formula and the input projected data values.

An example of this technique is helpful. Assume that it is desirable to know the present or future price sensitivity of a share of Microsoft common stock to any or all of the consumer price index (CPI), the gross national product (GNP) and the national unemployment rate. In accordance with the present invention, past values of the share price for Microsoft stock might be regressed against past data values for each of those three exogenous variables, in order to derive one or more price sensitivity formulas that describe how the price sensitivity of Microsoft common stock to each of the CPI, the GNP and the national unemployment rate vary as a function of those three quantities (or exogenous variables).

Then, projected data values for the CPI, the GNP and the national unemployment rate are obtained. For example, as described in the patent applications incorporated by reference in the present Specification, predictions from numerous individuals may be combined in order to generate forecasted values for each of the three indicated variables at a point in time one month in advance of the current date.

Lastly, these projected data values may be plugged into the price sensitivity formula obtained above in order to estimate the price sensitivity of a share of Microsoft common stock to any or all of the CPI, GNP and the national unemployment rate. The estimated price sensitivities may be deemed valid, for example, at the date that is one month in advance of the current date.

In short, the present invention provides asset evaluation/screening techniques in which different economic scenarios can be specified and then elasticities, sensitivities or similar measures of tendency of the asset value to change based on changes in one or

more exogenous variables can be projected under such scenarios. Such data can be used to screen or otherwise evaluate assets.

In a preferred embodiment of the invention, the foregoing technique is incorporated into an asset evaluation/screening tool, allowing users to input various "what if" (i.e., hypothetical) scenarios with respect to any of a variety of macroeconomic, industry-specific, firm-specific or even non-financial data and then obtain projected elasticities, sensitivities or similar measures for selected assets with respect to selected factors based on the input scenario.

ISSUES PRESENTED ON APPEAL

The issues are: (i) whether claims 1 to 18, 21 to 27, 37 and 39 are properly rejected under 35 U.S.C. § 103(a) over U.S. Patent 6,125,355 (Bekaert); and (ii) whether claims 19 and 20 are properly rejected under § 103(a) over Bekeart et al. in view of U.S. Patent 6,018,722 (Ray).

GROUPING OF THE CLAIMS

In the Office Action, the Examiner grouped the pending claims in a particular manner. However, for purposes of the present appeal, Appellants believe that the claims are more appropriately grouped as follows:

GROUP 1:   Claims 1, 12-20, 37 and 39

GROUP 2:   Claim 2

GROUP 3:   Claim 3

GROUP 4:   Claim 4

GROUP 5:   Claim 5

GROUP 6:   Claim 6

GROUP 7:   Claim 7

GROUP 8:   Claim 8

GROUP 9:   Claim 9

GROUP 10:   Claims 10 and 11

GROUP 11:   Claim 21

GROUP 12:   Claim 22

GROUP 13:   Claim 23

GROUP 14:   Claims 24-26

GROUP 15:   Claim 27

It is Appellants' intent that, solely for purposes of the present Appeal and for refuting the specific arguments set forth by the Examiner, the claims in each of the foregoing groups will stand or fall together, except that whenever any claim in one group depends (whether directly or indirectly) from a claim that ultimately is determined to be allowable, such dependent claim also should be allowed for at least the same reasons.

ARGUMENT

Discussion of Issues on Appeal

The requirements for establishing a prima facie case of a § 103 rejection have been stated as follows.

> "a proper analysis under § 103 requires, inter alia, consideration of two factors: (1) whether the prior art would have suggested to those of ordinary skill in the art that they should make the claimed composition or device, or carry out the claimed process; and (2) whether the prior art would also have revealed that in so making or carrying out, those of ordinary skill would have a reasonable expectation of success. [citing In re Dow Chemical Co., 837 F.2d 469, 473, 5 U.S.P.Q.2D 1529, 1531 (Fed. Cir. 1988).] Both the suggestion and the reasonable expectation of success must be found in the prior art, not in the applicant's disclosure."

In re Vaeck, 947 F.2d 488, 493 (Fed. Cir. 1991).

Thus, MPEP § 2142 requires that in order to establish a prima facie case of obviousness, the Examiner must cite prior art references that teach or suggest all of the claim limitations and, if more than one such reference is required to disclose all such limitations, there must be some suggestion or motivation, either in the prior art references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the reference teachings.

As discussed below, the above requirements for establishing a prima facie case of obviousness have not been met for any of the following groups of claims.

Group 1 Claims

Independent claims 1, 37 and 39 are directed to a method for evaluating an asset. Initially, historical data for the value of an asset and historical data values for plural exogenous variables are processed to obtain a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for the exogenous variables, the formula being a function of the exogenous variables. Projected data values for the exogenous variables are obtained, and a measure of the tendency of the value of the asset to change based on a change in at least one of the exogenous variables is estimated using the obtained formula and the input projected data values.

The foregoing combination of features is not disclosed or suggested by the applied art. In particular, the applied art does not disclose or suggest at least the feature of estimating a measure of the tendency of the value of an asset to change based on a change in at least one of plural exogenous variables, using an obtained

formula and projected data values for the exogenous variables, where the formula has been obtained based on historical data for the value of an asset and historical data values for the exogenous variables.

Bekaert, the sole reference relied upon by the Examiner in rejecting the above claims, primarily concerns asset *pricing* and is not seen to say anything at all about estimating a measure (e.g., price sensitivity or price elasticity) of the tendency of a value of an asset to change based on changes in one or more exogenous variables. As a result, Bekaert could not have disclosed or suggested processing historical asset value data and historical data values for plural exogenous variables to obtain a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for the exogenous variables, with the formula being a function of the exogenous variables.

Even the Examiner appears to acknowledge that Bekaert does not disclose or suggest even the broad concept of estimating a measure of the tendency of a value of an asset to change based on changes in one or more exogenous variables. On page 2 of the current Office Action (dated October 9, 2003), the Examiner does not even attempt to argue that Bekaert discloses or suggests this broad concept, but instead takes official notice that this concept is known in the art.

The Examiner appears to cite three references, a set of slides by Bodie (Bodie), pages 241-260 of a text by Makridakis (Makridakis) and U.S. Patent 6,473,084 (Phillips), in support of this official notice. At the outset, it is noted that the Phillips patent has the same inventors as the present application and issued subsequent to the

filing of the present application. Therefore, it could not be valid prior art against the present claims, and references to it made by the Examiner are disregarded in this Brief.

Appellants do not agree that Bodie and Makridakis teach what has been alleged by the Examiner. Nevertheless, Appellants acknowledge that it is known to estimate a measure of the tendency of a value of an asset to change based on changes in one or more exogenous variables. Bekaert, however, does not suggest performing any such estimation in any manner whatsoever.

As discussed in more detail in the following paragraphs, lacking any suggestion in this regard, Bekaert plainly could not have suggested the inventive features of the present claims. For example, the specific features mentioned above directly utilize the basic concept of estimating a measure of the tendency of a value of an asset to change, and extend that concept in a novel way.

For the most part, the specific portions of Bekaert that have been cited by the Examiner in this regard are completely unrelated to the general concept of estimating a measure of the tendency of a value of an asset to change based on changes in one or more exogenous variables. For instance, column 1 lines 9-20 of Bekaert only appears to discuss pricing modules; column 2 lines 29-30 only mentions arbitrage-free pricing; column 3 line 47 to column 4 line 30 generally discusses Bekaert's pricing module; and column 4 lines 60-62 simply notes that factor analysis is well-known in the art; column 6 lines 24-26 mentions the state variables for Bekaert's pricing module, none of which having any apparent relationship to the present feature of the invention; column 8 lines 1-3 simply refers to projection of inflation values; and claim 14 merely notes that in the claimed technique the estimated real rate of interest is determined based on a short-

term nominal rate of interest and a value of inflation is based on expected inflation and the nominal short-term rate of interest.

In the current Office Action, the Examiner focuses on column 4 lines 27-30 of Bekaert, which apparently is the only portion of Bekaert to even mention price sensitivity or, for that matter, any related concept. However, that portion of Bekaert does not refer to any of Bekaert's own processing, but rather is simply identifying one of the input parameters to Bekaert's pricing module. This conclusion is inescapable when one reads lines 24-27 (in addition to the cited lines 27-30) of Bekaert's column 4.

It is further noted that neither this very brief cited portion Bekaert, nor any other portion of Bekaert, says anything about a formula for calculating a measure of a tendency of the value of an asset to change as a result of changes in the data values for the exogenous variables, where the formula is a function of the exogenous variables, as recited in the present claims. As a result, Bekaert could not possibly disclose or suggest anything about obtaining projected data values for such exogenous variables or using such projected data values to estimate a measure of the tendency of the value of an asset to change.

In response to this point, the Examiner has simply asserted that generation of such a formula is inherent in Bekaert's pricing module, stating:

> "The input variables of the pricing module are interpreted to include historical data values and estimated prices include the step of estimating a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for the exogenous variables. Bekaert inherently teaches the step of estimating a measure of the tendency of the value of the asset to change based on a change in at least one of the exogenous variables using the formula obtained in step (a) and the projected data values input in step (b)."

While Appellants agree that the inputs to Bekaert's pricing module are historical data values for certain economic variables, this aspect of Bekaert is believed to have little to do with the present invention. Moreover, as noted above, Appellants are unable to find anything in Bekaert that discloses or suggests obtaining a formula for estimating a price sensitivity, price elasticity or any other measure of the tendency of the value of an asset to change based on changes in one or more exogenous variables.

In short, it appears that the Examiner is asserting that most, if not all, of the limitations of the present claims are inherent in Bekaert. Once again, Appellants acknowledge that it is known to generate a formula for calculating a measure of a tendency of the value of an asset to change as a result of changes in the data values for the exogenous variables (although not to use this concept as presently recited). However, this is quite different than asserting that this feature is inherent in Bekaert. In this regard, it has been held that:

> "To establish inherency, the *extrinsic evidence* [emphasis added] "must make clear that the missing descriptive matter is *necessarily present* [emphasis added] in the thing described in the reference, and that it would be so recognized by persons of ordinary skill." Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268, 20 U.S.P.Q.2d 1746, 1749 (Fed. Cir. 1991). 'Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' Id. at 1269, 20 U.S.P.Q.2d at 1749 (quoting In re Oelrich, 666 F.2d 578, 581, 212 U.S.P.Q. 323, 326 (C.C.P.A. 1981))."

In re Robertson, (Fed. Cir. 1999) 169 F.3d 743, 745; 49 U.S.P.Q.2d 1949.

The Examiner again briefly cites Bodie and Makridakis to support this assertion of inherency. However, Appellants have studied these two references in detail, but are unable to find anything in them to establish that the above-referenced features necessarily are present in Bekaert. In this regard, the Examiner has not even attempted

to explain how these two references would show such inherency. Rather, it appears that the Examiner is asserting inherency in the present case solely for the purpose of avoiding the requirement to make a showing, as should be required under the present circumstances, that there is some motivation to combine disparate teachings in the prior art to arrive at the present invention. Of course, it does not appear that there would have been any such motivation to combine Bodie and Makridakis with Bekaert in any such manner.

Furthermore, according to the present claims, historical data values for plural exogenous variables are used to obtain the formula (which itself is a function of the exogenous variables), and then projected data values for the exogenous variables are used in connection with the obtained formula to estimate a measure of the tendency of the value of the subject asset to change. Bekaert, on the other hand, apparently only uses historical data values for certain economic variables in order to generate estimates of current asset prices. In Bekaert, there appears to be no step of obtaining projected values for such economic variables and then using such projected data values in any manner similar to the presently recited technique.

Apparently based on the official notice mentioned above, the Examiner asserts that the foregoing features of the invention would have been obvious in view of the known use of regression coefficients. Specifically, the Examiner argues that by making the value of the asset in Bekaert's technique the dependent variable and by making Bekaert's input economic variables the independent variables, one _could_ estimate the effect of a change in Bekaert's input economic variables on the change in his calculated asset prices.

In response, it is noted that there is absolutely no motivation to modify Bekaert in any such manner. First, neither Bekaert nor the mere existence of price sensitivities, elasticities and the like (of which official notice is taken) even remotely suggests the desirability of estimating price sensitivities, price elasticities or any similar measure in Bekaert's technique. Second, apparently the only mention of regression in Bekaert is at column 12, lines 62-65, which merely mentions the possibility of calculating a price-dividend ratio by a summation of polynomial terms of certain state variables using linear regression; Bekaert does not appear to say anything about regressing asset price against his input economic variables for any purpose whatsoever. Third, the present claims recite that the formula for calculating a measure of the tendency of the value of an asset to change as a result of changes in the data values for exogenous variables is itself a function of the exogenous variables; this does not appear to be disclosed or suggested anywhere in Bekaert or by the mere existence of price sensitivities, elasticities and the like (of which official notice is taken). Finally, even if Bekaert disclosed such a regression (and it clearly does not), there still would have been no motivation to obtain projected data values for the exogenous variables and to use such projected data values in connection with the recited formula in order to estimate a measure of the tendency of the value of an asset to change.

In short, the teachings of Bekaert would have to be substantially supplemented and modified in order to achieve the present invention. The only motivation to do so would have to be based on Appellants' own disclosure, which of course is impermissible hindsight.

With regard to motivation to combine prior art teachings, the Federal Circuit has held as follows:

> "This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." [citation omitted]
>
> In re Lee, 277 F.3d 1338, 1343-44 (2002)

> "In its decision on [the subject] patent application, the Board rejected the need for "any specific hint or suggestion in a particular reference" to support the combination of the [applied art] references. 'Omission of [such] a relevant factor required by precedent is both legal error and arbitrary agency action.'"

Id. at 1344.

Here, no reference has been cited that would suggest incorporating the use of regression coefficients in any manner whatsoever into Bekaert's pricing modules, much less in any manner that would have resulted in the present invention.

Based on the foregoing remarks, independent claims 1, 37 and 39, together with their dependent claims 12-20, are believed to be allowable over the applied art.

Group 2 Claim

Claim 2 depends from claim 1 (in Group 1) and recites the further limitation that the asset comprises a share of stock in a corporation. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner cites column 3, lines 39-44 of Bekaert as showing this feature of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose stock pricing, and not the feature of estimating a measure of the tendency of the value of a share of stock in a corporation to change based on a change

in at least one of plural exogenous variables, using an obtained formula and projected data values for the exogenous variables, where the formula has been obtained based on historical data for the value of stock and historical data values for the exogenous variables.

For these additional reasons, claim 2 is believed to be allowable over the applied art.

Group 3 Claim

Claim 3 depends from claim 1 (in Group 1) and recites the further limitation that the asset comprises a portfolio of shares of stock in plural different corporations. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner cites column 3, lines 43-46 of Bekaert as showing this feature of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose mutual fund pricing, and not the feature of estimating a measure of the tendency of the value of a portfolio of shares of stock in plural different corporations to change based on a change in at least one of plural exogenous variables, using an obtained formula and projected data values for the exogenous variables, where the formula has been obtained based on historical data for the value of the portfolio and historical data values for the exogenous variables.

For these additional reasons, claim 3 is believed to be allowable over the applied art.

Group 4 Claim

Claim 4 depends from claim 1 (in Group 1) and recites the further limitation that the asset comprises an index. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner cites column 3, lines 43-46 of Bekaert as showing this feature of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose mutual fund pricing, and not the feature of estimating a measure of the tendency of the value of an index to change based on a change in at least one of plural exogenous variables, using an obtained formula and projected data values for the exogenous variables, where the formula has been obtained based on historical data for the value of the index and historical data values for the exogenous variables.

For these additional reasons, claim 4 is believed to be allowable over the applied art.

Group 5 Claim

Claim 5 depends from claim 1 (in Group 1) and recites the further limitation that the asset comprises a mutual fund. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner cites column 3, lines 43-46 of Bekaert as showing this feature of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose mutual fund pricing, and not the feature of estimating a measure of the tendency of the value of a mutual fund to change based on a change in at least one of plural exogenous variables, using an obtained formula and projected data values for the

exogenous variables, where the formula has been obtained based on historical data for the value of the mutual fund and historical data values for the exogenous variables.

For these additional reasons, claim 5 is believed to be allowable over the applied art.

Group 6 Claim

Claim 6 depends from claim 1 (in Group 1) and recites the further limitation that the value of the asset comprises a market price for the asset. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner cites column 3, lines 39-44 of Bekaert as showing this feature of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose asset pricing, and not the feature of estimating a measure of the tendency of the market price for an asset to change based on a change in at least one of plural exogenous variables, using an obtained formula and projected data values for the exogenous variables, where the formula has been obtained based on historical data for the market price of the asset and historical data values for the exogenous variables.

For these additional reasons, claim 6 is believed to be allowable over the applied art.

Group 7 Claim

Claim 7 depends from claim 1 (in Group 1) and recites the further limitation that a price formula that describes the value of the asset as a function of the exogenous variables is calculated and then a derivative of the price formula is estimated to obtain the formula. This additional feature of the invention is not disclosed or suggested by the applied art.

The Examiner has not cited any portion of Bekaert as disclosing or suggesting that a derivative be estimated for any price formula, much less for the purpose of obtaining the formula recited in the present claims. In addition, Appellants have carefully studied Bekaert and are unable to find any such disclosure or suggestion.

For these additional reasons, claim 7 is believed to be allowable over the applied art.

Group 8 Claim

Claim 8 depends from claim 7 (in Group 7) and recites the further limitation that the price formula is obtained by performing a non-linear regression using the historical data for the value of the asset and the historical data values for the plural exogenous variables. This additional feature of the invention is not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of non-linear regression. However, the Examiner then goes on to take official notice that "the step of using non-linear regression...for estimating a formula is old and well-known in the art," and then states that it would have been obvious to combine non-linear regression with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002).

In the present case, however, the Examiner has cited nothing suggesting that the use of non-linear regression would be desirable in any manner in connection with

Bekaert's technique. Accordingly, the present § 103 rejection is believed to be improper.

For these additional reasons, claim 8 is believed to be allowable over the applied art.

Group 9 Claim

Claim 9 depends from claim 7 (in Group 7) and recites the further limitation that the price formula is obtained by performing neural network processing using the historical data for the value of the asset and the historical data values for the plural exogenous variables. This additional feature of the invention is not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of neural network processing. However, the Examiner then goes on to take official notice that "the step of using...neural network processing for estimating a formula is old and well-known in the art," and then states that it would have been obvious to combine neural network processing with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002).

In the present case, the Examiner has cited nothing suggesting that the use of neural network processing would be desirable in any manner in connection with Bekaert's technique. Accordingly, the § 103 rejection is believed to be improper.

For these additional reasons, claim 9 is believed to be allowable over the applied art.

Group 10 Claims

Claim 10 depends from claim 7 (in Group 7) and recites the further limitation that the price formula is in the format of a truncated Taylor series expansion. Claim 11 depends from claim 10 and recites the further limitation that the price formula is in the format of a truncated Maclaurin series expansion. These additional features of the invention are not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of a truncated Taylor or Maclaurin series expansion. However, the Examiner then goes on to take official notice that "the step of using a truncated Taylor series expansion or a truncated Maclaurin series expansion to estimate a formula is old and well-known in the art," and then states that it would have been obvious to combine such concepts with Bekaert to achieve this feature of the invention.

However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002). In the present case, the Examiner has cited nothing suggesting that the use of a truncated Taylor or Maclaurin series expansion would be desirable in any manner in connection with Bekaert's technique. Accordingly, this § 103 rejection is believed to be improper.

Moreover, the Examiner's statement that "Truncating a series expansion significantly reduces the number of computations necessary to estimate the model without significantly sacrificing the accuracy of the estimated model" is unfounded and does not indicate why one skilled in the art would be motivated to use a truncated Taylor or Maclaurin series expansion over a Fourier, Discrete Cosine, or other series

expansion or, for that matter, over any of the other nearly infinite possible representations.

For these additional reasons, claims 10 and 11 are believed to be allowable over the applied art.

Group 11 Claim

Claim 21 depends from claim 1 (in Group 1) and recites the further limitations of repeating the entire process for plural different assets and selecting a subset of the plural different assets based on the estimated measure for each of the plural different assets. These additional features of the invention are not disclosed or suggested by the applied art.

The Examiner cites column 4, lines 17-23 of Bekaert as showing these features of the invention. However, that portion of Bekaert has been studied in detail and is only seen to disclose a portfolio optimization module that receives as inputs projected asset prices, and says nothing about the presently claimed feature of selecting a subset of assets based on estimates of the measures of the tendency of each asset value to change based on changes in one or more other variables.

For these additional reasons, claim 21 is believed to be allowable over the applied art.

Group 12 Claim

Claim 22 depends from claim 21 (in Group 11) and recites the further limitations of determining whether the formula for each of the plural different assets is capable of estimating the measure of the tendency of the asset value to change, for each of the plural different assets, with sufficient reliability, with the selected subset of assets having

been based on such determinations. These additional features of the invention are not disclosed or suggested by the applied art.

In fact, the Examiner acknowledges that Bekaert fails to teach these features of the invention. However, the Examiner then goes on to take official notice that "the step of determining the reliability of the estimated model and selecting a subset of assets based on the reliability of the models are well known in the art," further stating that it would have been obvious to combine these features with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002).

In the present case, the Examiner has cited nothing suggesting that determining the reliability of a formula for calculating a measure of a tendency of the value of the asset to change as a result of changes in the data values for exogenous variables and then selecting a subset of assets based on such reliabilities would be desirable in any manner in connection with Bekaert's technique. Accordingly, the § 103 rejection is believed to be improper.

For these additional reasons, claim 22 is believed to be allowable over the applied art.

Group 13 Claim

Claim 23 depends from claim 1 (in Group 1) and recites the further limitation that the formula is obtained by performing a non-linear regression using the historical data for the value of the asset and the historical data values for the plural exogenous

variables. This additional feature of the invention is not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of non-linear regression. However, the Examiner then goes on to take official notice that "the step of using non-linear regression... for estimating a formula is old and well-known in the art," and then states that it would have been obvious to combine non-linear regression with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002).

In the present case, the Examiner has cited nothing suggesting that the use of non-linear regression would be desirable in any manner in connection with Bekaert's technique, much less in connection with determining a formula for calculating a measure of a tendency of an asset value to change as a result of changes in data values for certain exogenous variables. Accordingly, the § 103 rejection is believed to be improper.

For these additional reasons, claim 23 is believed to be allowable over the applied art.

Group 14 Claims

Claim 24 depends from claim 1 (in Group 1) and recites the further limitation that the formula is obtained by performing neural network processing using the historical data for the value of the asset and the historical data values for the plural exogenous

variables. This additional feature of the invention is not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of neural network processing. However, the Examiner then goes on to take official notice that "the step of using... neural network processing for estimating a formula is old and well-known in the art," and then states that it would have been obvious to combine neural network processing with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002).

In the present case, the Examiner has cited nothing suggesting that the use of neural network processing would be desirable in any manner in connection with Bekaert's technique, much less in connection with determining a formula for calculating a measure of a tendency of an asset value to change as a result of changes in data values for certain exogenous variables. Accordingly, the § 103 rejection is believed to be improper.

For these additional reasons, claim 24, and its dependent claims 25 and 26, are believed to be allowable over the applied art.

Group 15 Claim

Claim 27 depends from claim 1 (in Group 1) and recites the further limitation that the formula is obtained by using a genetic algorithm. This additional feature of the invention is not disclosed or suggested by the applied art.

In this regard, the Examiner acknowledges that Bekaert fails to teach the use of a genetic algorithm to obtain any formula. However, the Examiner then goes on to take official notice that "using a genetic algorithm to obtain a formula is old and well-known in the art," and then states that it would have been obvious to combine use of a genetic algorithm with Bekaert to achieve this feature of the invention. However, as noted above, the "factual question of motivation is material to patentability, and [can] not be resolved on subjective belief and unknown authority." In re Lee, 277 F.3d 1338, 1343-44 (2002). In the present case, the Examiner has cited nothing suggesting that the use of a genetic algorithm would be desirable in any manner in connection with Bekaert's technique. Accordingly, the § 103 rejection is believed to be improper.

Moreover, the Examiner's statement that "a genetic algorithm could provide a more robust and efficient formula for certain situations compared to conventional regression techniques" is unfounded and does not indicate why one skilled in the art would be motivated to use such a technique in connection Bekaert at all, much less in connection with determining a formula for calculating a measure of a tendency of an asset value to change as a result of changes in data values for certain exogenous variables.

For these additional reasons, claim 27 is believed to be allowable over the applied art.
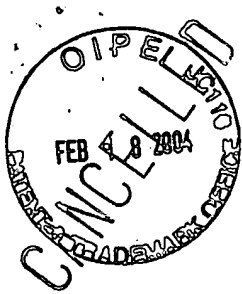
CONCLUDING REMARKS

As Appellants have shown above, for a number of reasons, nothing in the cited references discloses, teaches, or suggests the invention recited by the claims on appeal. Appellants therefore respectfully submit that the claimed invention is patentably distinct over the applied art.
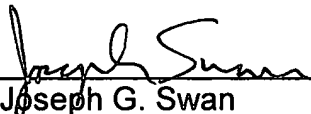
In view of the foregoing remarks, Appellants respectfully request that the rejection of claims 1-27, 37 and 39 be reversed and a Notice of Allowance issued.

Respectfully submitted,

MITCHELL, SILBERBERG & KNUPP LLP

Dated: February 17, 2004

By_____
Joseph G. Swan
Registration No. 41,338

MITCHELL, SILBERBERG & KNUPP LLP
11377 West Olympic Boulevard
Los Angeles, California 90064
Telephone: (310) 312-2000
Facsimile: (310) 312-3100

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